MANAGING CHANGE DECISIONS IN A CONSTRUCTION PROJECT

Mat-Zin, Rosliza
School of Accountancy, UUM College of Business,
Universiti Utara Malaysia, Kedah, Malaysia
rosliza@uum.edu.my
Tel: 0060 4 9283905

INTRODUCTION

Project success or failure is generally determined by whether the contributors achieve cost savings or experience cost overruns. The literature reveals that problems of construction projects were generally due to cost overruns and delays (see for example Lim and Mohamed, 2000), which are linked to the difficulty of managing inter-firm relationships (Assaf et al., 1995). An appropriate governance structure, including management control structures may decrease failures (Das and Teng, 2001a). The paper argues that the major control issue in projects is integrating and coordinating resources (e.g. Dekker, 2004) to accomplish the client's objectives. Some argue that effective control is a source of competitive advantage of inter-firm relationships (Dyer and Singh, 1998; Ireland et al., 2002), making the control structure chosen for project-based organizations crucial.

The project cycle starts with the conception of a building to be constructed and develops through detailed design stages to construction on site, completion, and use of the building. These tasks are highly inter-dependant involving architects, engineers, main contractor, subcontractors, and suppliers. The integration of different areas of expertise is needed to specify, design and construct buildings. The selection process and management of interdependent tasks during project execution suggest that doing so is challenging because of the difficulty of safeguarding specific investments with an incomplete contract. Ireland et al. (2002) argued that effective project management begins by selecting a project team with appropriate characteristics (e.g. familiarity, skills certification, reputation). Selection of contributors (project team) based on familiarity for repeated relationships can reduce the need for formal control and lessen the possibility of opportunistic behaviours (e.g. Gulati, 1995). Williamson (1975) suggested that it is impossible to write a contract that specifies the responsibilities of each contributor in projects. Hence the contracting parties are left with the use of an incomplete contract, which can result in adaptation problems and exposes them to opportunistic behaviour.

Thompson (1967) argues that the more complex the organisation, the greater the interdependence of tasks, and the more severe are the coordination problems. Interdependence can affect workflows (Macintosh and Daft, 1987) and the degree of coordination and control of the work units. Pooled interdependence, which is the lowest level of interdependence, leads to

standardised coordination through rules and procedures. Sequential interdependence occurs when each unit completes their workflow from a preceding department. This demands greater coordination and control compared to pooled interdependence. Reciprocal interdependence is characterised by the movement of work back and forth among departments. Standardisation and accounting information are not sufficient for coordination. Feedback and mutual adjustments are the basis of coordination among the departments. It is argued that most construction projects are reciprocally and sequentially interdependent, hence formal control is used alongside informal control. Sequential interdependencies can be integrated by ensuring proper information flows in accordance with formal plans, but reciprocal interdependencies need to be integrated using mechanisms that ensure the contributors make the correct combinations at the right times (Walker, 1996: 140), which requires informal information for mutual readjustment of plans.

This study assumes that the practice of MCS depends on the specific circumstances or situation in which an organization operates (Otley, 1980; Dent, 1986; Chenhall and Morris, 1986; Briers and Hirst, 1990), and it focuses on the characteristics of relationships in project-based organizations. The need to meet contractual deadlines, budgets and standards, and the legal implications of decisions make the management of construction work in an uncertain task environment very dynamic. The basic premise here is that there are important links between objectives, organization structure, control and environment, and that the combination of these variables will determine the project performance. This study, however does not study performance rather it focuses on the management control structures of inter-firm relationships in project-based organizations.

The research account is structured in the paper as follows. Section 2 proposes an extended theoretical framework that guides the study and helps make sense of the process of managing change decisions within the interdependent tasks of inter-firm relationships in project-based organizations. The research methods are explained and justified in section 3. It describes the research design, the method of gathering and analyzing data, and details of the research stages undertaken in understanding and analyzing the case. Section 4 presents a description on the project studied. It then examines the case in determining the control mechanisms used during the

transition phase. The last section concludes the paper by summarizing the study, its implications and limitations, and suggests possible directions for future research.

THE FRAMEWORK

An initial theoretical model using transaction cost economics (TCE) was turned to following the emerging themes found from the initial data analysis and the literature review and it was refined as an ongoing process as further themes emerged from data analysis. The extension of the model is important as the empiric revealed extensive use of informal means of control, which receive less attention in TCE. The framework extends TCE for it is argued that TCE puts human factors (i.e. bounded rationality and opportunism) in the background and ignores the effects of prior and repeated relationships between firms (Gulati, 1995; Ring and van der Ven, 1992; Dekker, 2004). Repeated relationships between firms can cause social embeddedness, which may influence its formal structure (Dekker, 2004).

The paper proposes that the issue of temporary inter-firm formation, the choice of governance structure and its effectiveness can be informed by TCE. The model suggests that individual attributes (bounded rationality and opportunism) both act on information asymmetry, as do transactional attributes (asset specificity, uncertainty and frequency). An efficient governance mode is therefore reached by matching control problems caused by transaction attributes and behavioural uncertainty with the governance structures. TCE assumes that transacting parties will choose the most economical form of governance based on the transaction costs involved. Furthermore, TCE argues the characteristics of transactions (mainly the specific investments, frequency, and uncertainty) and behavioural uncertainty explain the source of transaction costs.

Essential in sustaining transaction relationships, the paper recognizes social elements (e.g. trust) as an important lubricant of the social system (Arrow, 1974). This situation creates demand for informal or social mechanisms to govern transactions. The paper argues that information asymmetry problems due to individual attributes and transaction characteristics can be lessened by informal mechanisms. In explaining the case observed, the paper concentrates on the formal process of contract administration of contractual relationships, and by incorporating informal

process, which can be described as the coordination of interdependent tasks of transacting parties. Hence, the paper concentrates on project processes (during transition phase, where change decision was made) and relationships, which TCE refers as transaction or transaction relationships (e.g. van der Meer-Kooistra and Vosselmen, 2000).

Consistent with TCE, the paper conjectures that contracts are bound to be incomplete, and increasingly so when uncertainty arises. Williamson (1985: 60) argued that with transactions characterized by asset specificity and uncertainty it is "imperative that the parties devise a machinery to 'work things out', since contractual gaps will be larger and occasions for sequential adaptations will increase in number and importance as the degree of uncertainty increases". Due to bounded rationality, decision makers cannot possess all the information required to make optimal decisions. Many decisions about the design of inter-firm management control relationships and production decisions normally are made after the first decision about contracting forms have been made and during the construction process. TCE assumes that given bounded rationality, transactions cannot rely on market contracting alone: "If, in consideration of these limits, it is very costly or impossible to identify future contingencies and specify, *ex ante*, appropriate adaptations, thereto, long-term contracts may be supplanted by internal organization. Recourse to the latter permits adaptations to uncertainty to be accomplished by administrative processes in a sequential fashion. Thus rather than attempt to anticipate all possible contingencies at the outset, the future is permitted to unfold" (Williamson, 1975: 9).

While bounded rationality suggests an incomplete contract, opportunism in construction (see Reve and Levitt, 1984; Winch, 1989) is due to information asymmetry between the contributors. When economic agents (the contributors) build a transaction relationship in a specific investment (the project), it is assumed that the information possessed by them (human asset specificity) raises the possibility of opportunistic behavior. Information asymmetry occurs when one party to a transaction has more or better information than the other party. As TCE proposes, asset specificity rises with the degree of interdependence. Given that there are a number of contractual relationships between contributors of a project-based organization, the paper further argues that

due to task interdependency, it is costly to change or disturb the governance structure. The aim is to maintain cost efficiency of transaction relations.

To lessen information asymmetry problems and facilitate coordination, it is expected that formal control mechanism, e.g. (contract document - tasks schedule, job specification, bill of quantity, drawings) will be used extensively. The paper suggests that as the process becomes more interdependent and uncertain, the need for more coordination and mutual adaptation and adjustment increases (Galbraith, 1977; Borys and Jemison, 1989; Dyer, 1996; Gulati and Singh, 1998). Though the paper argues that the terms and conditions required in the contract determines how project organization is controlled, the framework suggests that informal control mechanisms influence the strength of relationships.

Nonetheless, the use of incomplete contract in achieving the objectives of the project suggests that coordination issues need to be augmented with informal means of control. Individuals must rely on common understandings to complete the exchange (Neu, 1991). Control based on incomplete contracts is a big issue, thus it is suggested that transaction relationships should not only be based on formal mechanisms. Rather the paper argues that relationships may rely on informal or social means (e.g. competence trust), for example, the professional standards of the contributors (Walker and Chau, 1999). As TCE only concentrates on formal contractual relationships, the paper suggests that the initial framework using TCE as a basis needs to be extended by incorporating informal means of control. The inclusion of informal mechanisms is important as was evident from data analysis.

TCE has been criticized for not adequately considering the social context in which relationships are embedded. The paper argues that social embeddedness not only influences the practice of MCS but also the relationships and the parties' behavior, particularly the level of opportunism (Granovetter, 1985; van der Meer-Kooistra and Vosselman, 2000; Langfield-Smith and Smith, 2003; Dekker, 2004). Thus, they suggested comprehensive models using TCE to study MCS of inter-firm transaction relationships, which include: Spekle (2001), who developed a model of control archetypes for the hybrid form of relations; Nooteboom (1996), who developed a model

of control for partnerships; Das and Teng (2001b), who categorised relationships between MCS, trust and risk; and Van der Meer-Kooistra and Vosselman (2000), Langfield-Smith and Smith (2003), Kamminga (2003), Dekker (2004), Vosselman and van-der Meer-Kooistra (2006) and Vosselman and van-der Meer-Kooistra (2009), who integrated TCE and social-based approaches to study management control of inter-firm transaction relationships. Nieminen and Lehtonen (2008) also found that clan control and self-control complement bureaucratic control mechanisms in managing change programme teams.

Furthermore the paper argues that TCE ignores the effects and prior interactions (Gulati, 1995; Ring and van de Ven, 1992; Dekker, 2004) between transacting parties, which influence the frequency dimension. As Dekker (2004: 31) argued, "Repeated interactions can cause an inter-organizational relation to become embedded in an influential and social context, which may strongly influence its formal structure". The informal or social control (Dekker, 2004) differs significantly from control by prices in market mediation and administrative kind in bureaucracy. Hence, they need to be incorporated in the model.

The framework, hence, extends TCE by considering informal or social elements, which also influence how relationships in project organization are governed. This is consistent with Gulati's argument (1995: 86) that, "repeated alliances and the emergent processes resulting from prior interactions between partners may alter their calculus when they are choosing contracts in alliances".

The framework suggests that formal control consists of contractual obligations, and its mechanisms can be subdivided into outcome and behaviour control (Ouchi, 1979). Informal control, also referred to social control relies upon common agreement between parties on what constitutes proper behaviour (Ouchi, 1979). Outcome, behaviour, and informal control are useful mechanisms for control purposes in contract administration and coordinating interdependent tasks.

Based on the literature on project-based organizations, Table 1 identifies and classifies several outcome, behaviour, and informal (social) control mechanisms. The control mechanisms are expected to be used in managing transactions of inter-firm relationships in project-based organizations during pre- (*ex ante* mechanisms) and post-contract stages (*ex post* mechanisms). *Ex ante* control mechanisms mitigate control or adaptation problems by selecting the right partner before forming the project-based organization. During the execution of transaction relationships adaptation problems are managed by *ex post* mechanisms to achieve control purposes by processing information and evaluating performance (Dekker, 2004; Ittner et al., 1999; Ouchi, 1979).

Table 1 Formal and Informal Control Mechanisms

Outcome Control	Behaviour Control	Informal Controls
During Formation *(Ex ante mechanisms):*		
Pre-selection process Tendering Process Estimation and Scheduling	Project Organization Structure Trades specialists	Reputation, familiarity, (prior relationships)
During Execution *(Ex post mechanisms):*		
Contract Administration - Progress reports	Behaviour monitoring - supervisions, testing on compliance	Developing social relations - meetings, repeated interactions

Outcome control mechanisms specify results to be realized by transaction relationships and monitor the achievement of the targeted results. Control mechanisms during formation include project estimation and job scheduling set directions for task performance. Control mechanisms during execution include contractual elements written in the contract.

Behavior control specifies how contributors are monitored and supervised. Typical *ex ante* behavior control include planning, programs, rules, standard operating procedures (Gulati and Singh, 1998). *Ex post* behavior control as suggested by Das and Teng (1998: 506-7) include, "reporting and checking devices, written notice of any departure from the agreement, accounting examination, cost control, quality control, arbitration clauses, and lawsuit provisions".

Informal control mechanisms include reputation, familiarity, and the principal mode of social control in inter-firm relationships - trust (e.g. Dekker, 2004; Adler, 2001; Ring and van de Ven, 1992). The paper considers two forms of trust relevant to the formation and management of project organizations: competence and goodwill trust. Competence and goodwill trust may be present before the temporary organization is formed and they develop over time (Van der Meer-Kooistra and Vosselman, 2000; Langfield-Smith and Smith, 2003; Vosselman and van-der Meer-Kooistra (2006); Vosselman and van-der Meer-Kooistra (2009) through repeated interactions. Thus, the paper proposes that project organizational control is achieved through both formal and informal controls given the contract requirement must be complied with and interdependent activities need to be coordinated.

This paper suggests that the complexity of project organizational control is attributable to the involvement of various transaction relations between several organizations. Furthermore, the susceptibility of project-based organizations to environmental and contextual changes (e.g. social, economic, and political conditions) complicates the issue of coordination and control. Thus, in order to be able to acquire better understanding of the project organizational control, case research seems to be the most appropriate method.

The model suggests how control problems, as described by the variables from TCE and social embeddedness, influence the control mechanisms used to form and manage inter-firm relationships in a project-based organization. To conceptualize the model, the paper presumes that the purposes of control are to administer the contract (relationship-specific asset) and to coordinate interdependent tasks between its contributors. The two purposes of control jointly describe the extent of formal and informal control mechanisms are useful in managing the problems that arise.

RESEARCH DESIGN

The research question for the study, deduced as a result from interplay between data analysis, the theoretical framework, and literature review is:

> *What control mechanisms were used during the transition period where there was a change of contract?*

Data was collected by semi-structured interviews with key participants directly involved in the construction project, complemented by direct observation, and by an analysis of the contract and other documents related to the building construction industry. In addition, the researcher had informal conversations with the interviewees especially during lunch and by talking with labourers during their break. These informal conversations helped the researcher to understand the project process better compared to formal interviews. Key participants included project managers (internal and external), directors (client and contractor), the architect and his representative (the resident architect who was full-time on site), engineers (mechanical and engineering, civil and structural, landscape, the resident engineer who was full-time on site), quantity surveyors (both from consultant and contractor), and the site supervisor. Other informants included foreman, sub-contractors (e.g. masonry, carpentry and bar-bender), clerks (from the site office and the main offices of both client and contractor), and some labourers on site. The interviews were conducted either on the construction site or at the main offices of the contributors. The process of gathering evidence was considered complete when the researcher obtained good understanding of the work processes and problems surrounding the case studied.

In making sense of construction project organizational control, the researcher relied most on the explanations and the documents on site. Data from interviews and documents were analyzed through continuous interplay between data collection and analysis as suggested by Strauss and Corbin (1998). This approach facilitated iteration and link of the evidence with constant comparison across them, which is to control the conceptual level and scope of the emerging theory (Orlikowski, 1993). The iterative examination yielded a set of broad categories and concepts that describe events and actions. Some theoretical constructs (e.g. control mechanisms including formal and social/relational type, organizational structure, construction project management, and contract administration activities) were grasped before entering the field. The

theoretical constructs gathered from the literature helped the researcher to perceive and understand the case in a more systematic approach, which was important given that the researcher was new to this approach. The phonetic view (from an outsider) was crucial for forming a basic model for making sense of what happened in context. The process enabled the researcher to systematically code the concepts into categories, which were then integrated into an initial model of MCS of project-based organization. The incorporation of a phonemic view (from insiders) was crucial, for some concepts and terms were outside the boundary of the management control literature. It helped the researcher to refine and extend the initial theoretical framework.

Most interviewees referred their explanations to written materials (e.g. contracts, drawings, job specifications, bills of quantity) especially when they explained their role and responsibilities on site. This method was insightful as it strengthened the understanding of the researcher, and further increases the validity of data.

Furthermore, to ensure that the interpretation of 'stories' given by participants was understood, the results of fieldwork were fed back to some key participants - the project coordinator and the project manager during the final stage of data analysis. The on-going discussions on the research report with key participants were done through emails and phone conversations. The relationship between the researcher and the key participants improved through the on-going interactions, which helped gather 'stronger data' (Miles and Huberman, 1994). Due to the time constraint, key participants have not reviewed the final case study report. Nonetheless, feedback on both the representativeness of data gathered and the plausibility of the conclusions and explanations was received from a few informants in the field.

BETA PROJECT

The focus of the paper is on the management control practice of a project-based organization, specifically a case of building construction project in South-East Asia. The case studied is referred to Project BETA (named anonymous), worth over £20 million, owned by a client, a property developer. The project site covers an area of 27.057 acres, which consists of four

parcels: parcel A (mosque and infrastructure, e.g. road, parking area, landscape); parcel B (orphanage and old peoples' home, apartments, library, multi-purpose hall and schools); parcel C (hostel and hospital); and a utilities parcel (e.g. elevated water tank, sewerage treatment plant, road and drainage). The project organization structure formed to construct buildings for the client, consisted of inter-firm relationships and included the consultants (architect, civil and structural (C&S) engineer, mechanical and engineering (M&E) engineer, landscape engineer, interior designer), main contractor, sub-contractors, suppliers and advisor.

In a turnkey contract the project manager was responsible for ensuring that the teams involved carried out their appointed tasks according to specific elements in the contract. According to the consultants, the client hired SPC to manage the project on their behalf because the client possessed no skills or expertise in managing big construction projects. SPC was awarded a turnkey contract to design and build the whole complex. They were responsible for all the activities of the project, including obtaining building permits and bonds, establishing necessary safeguards, and providing temporary facilities for management, material storage, and sanitation and water supply. To manage the work, SPC appointed a full-time resident site team, headed by a project manager with overall responsibility for the site and handling contractual matters, who directly reported to the company director. The main functions of the site team were to plan, co-ordinate, and control sub-contracted work, and to provide a channel of communication for information transmitted from the design team to sub-contractors. The sub-contractors generally supplied labourers with the skills needed at any point. The project manager, using project scheduling, budgeting, quality control, progress meetings, contractual arrangements, and leadership and communication skills, was responsible for ensuring that everyone involved with the project carried out their appointed tasks.

Progress monitoring primarily ensured that works carried out by the contractor were in accordance with the stipulations of the contract. According to the project manager and project director there were two methods of monitoring on site – through regular progress meetings and proper site records, e.g. site diary. Contract documents, drawings, details and explanatory drawings to explain earlier documents and bill of quantities were compared with actual work performance.

The Transition Period

But later in September 2001 another contractor, DSC, continued with the construction work. The construction work was not put on hold because the buildings needed to be operational by the end of the year. The client managed to find a local contractor to continue the construction work. According to the client's project director, "We awarded the work to a local contractor to continue the execution work of parcel C because we do not want to hold up the project for a long period. This is due to the fact that we have started the operation of the school and orphanage home this month. We need to operationally use the hospital and hostel within the period as in the contract." The finding shows that time constraints are important for understanding temporary, project-based organisations. Time is a crucial factor (see Lundin, 1995) because times specified in the contract requirements affect conversion processes and project performance.

When DSC was working on site, SPC was still on site finalising the costs and accounts for the other parcels. The client could not possibly make both contractors responsible for one particular site at the same time. The project director commented, "We could not award the new contractor then because there shouldn't be two main contractors on site at the same time". This was because the parties needed to comply with laws, regulations and standards issued by public authorities in relation to construction work that disbarred this. Lack of compliance with legal requirements could result in the suspension of construction work or lead to legal suits. Given the time constraint, the parties had little choice but to risk proceeding with the construction work without a formal contract during the transition period. As there was no written contract between the transacting parties, the work progress was monitored informally. The next section investigates this further.

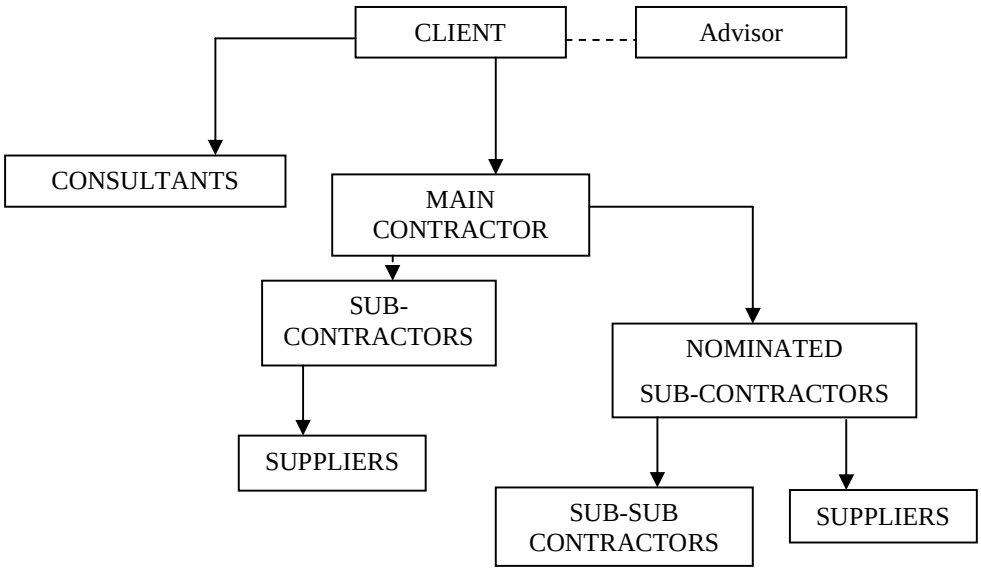
Project-Organisation Structure

The new main contractor, DSC, continued the construction activities according to the existing contract previously agreed by the former team. The main contractor, DSC is a local based company formed in November 1988. It started as an infrastructure-based company, mostly for constructing highways, and then refocused on buildings, factories and infrastructures. It has 52

full-time staff with experience in constructing properties, schools and hospitals. Given the design and specifications of the consultants following agreements with the client and SPC, DSC had only to continue the construction work and not get involved with design and drawings. They were offered continuance of work on parcel C with a build-only contract. The project organisation structure using the traditional contract is presented in Figure 1.

With the conventional, build only contract, the client managed the project itself. They had a project manager to handle the project on their behalf instead of relying on another company, as in a turnkey contract (where the main contractor manages the project on behalf of the client). With a build only contract, the client managed the project with advice from consultants and the client appointed the consultants. The build only contract specified consultants with direct contractual relationship with the client. The difference between a turnkey and build only contract was that under the latter the consultants reported directly to the client, were paid by the client (management fees), and the main contractor was directly responsible to the client.

Figure 1 Project Organisation Structure: Build-only (Conventional) Contract



With the change of main contractor and type of contract, the client still hired the same consultants to proceed with design details and drawings for parcel C. Other contributors, including trade specialists (sub-contractors and nominated sub-contractors), remained the same except for the main contractor, SPC. The new team included the main contractor (DSC), sub-contractors, the same consultants (i.e. architect, engineers, quantity surveyor) and the advisor for the hospital. As the project director explained, "Consultants, which include the civil and structural (C&S) engineer, mechanical and engineering (M&E) engineer, landscape engineer, quantity surveyor and interior designer, were appointed by us and are headed by the architect. An advisor, expert in hospital management, was appointed also to give advice on the hospital construction". With the new type of contract the role and responsibilities of the consultants remained the same except that they now had to report directly to the client. Before this, with the turnkey contract, they reported to the main contractor although they were responsible for work supervision.

With the new organisation structure there were two project managers full-time on site: one from the client company (internal project manager); and the other from the main contractor (external project manager). The (external) project manager worked under the director of DSC. The internal project manager managed the project as a whole and managed both the main contractor and also the consultants. Any instructions and variations to the main contractor came through the internal project manager with the consultants' advice. The role of the external project manager was to plan work activities on the project, whilst the site manager and supervisor scheduled and monitored the work of sub-contractors on site daily. As the project manager (external) explained, "my tasks are to coordinate, liaise information with consultants, give information to the site manager to schedule the work activities on site, and liaise with the quantity surveyor to order materials".

The external project manager explained that other parties under him, who worked full time on the site were responsible for monitoring activities, and arranged orders and the delivery of materials. Under the site manager, they had four senior supervisors depending on the trade, building works, infrastructure work, and mechanical and engineering works. These site agents were responsible for monitoring the work of sub-contractors. The supervisors were responsible

for checking construction activities on site and checking work from the previous day, safety problems, daily communications with resident architect or resident engineer (RA/RE), and also dealing with the regulators. The quantity surveyor (QS), from the main contractor company, which was different from the quantity surveyor (QS), one of the consultants) was responsible for handling the project's account (also claims and submissions) and purchasing materials. The QS of the main contractor commented that he was only occasionally on site, thus he had to rely on the site agents to gather cost information. Basically he compared the costs of the tender and actual costs incurred. He added that he also scheduled the materials to be ordered or purchased based on the drawings and the project schedule. The mechanical and electrical (M&E) coordinator was responsible for mechanical and electrical works, and liaised with the M&E engineer (of consultant) and the sub-contractors.

Management Control Systems during the Transition Period

There were no formal contracts between the client and the new main contractor (i.e. they were not legally bound) during the transition period. TCE suggests that when there is no formal contract, market-based controls will predominate, i.e. price and output control, not bureaucratic or behaviour controls. However, it was predicted that social-based controls would be efficient because there was an intention to contract.

The findings showed, i.e. trust rather than market relations prevailed then. The selection of new main contractor, DSC was done on a relational basis, based on past relationships and work done previously by the contractor for the client. The main contractor agreed to the verbal offer from the client to complete parcel C on the basis of reputation and past transaction relations with the client. DSC's director said, "In most cases we get invited on a project, either by their companies, subsidiaries or friends for whom we've done jobs. They keep giving us jobs". At this point, the social element of competence and goodwill trust was crucial because the contracting parties agreed to work on the project without a formal signed contract.

The interdependence of activities during the conversion process made it vital for the client to know the competency knowledge gained from and experience of the new main contractor. By

selecting a familiar main contractor (DSC), the client believed that the contractor would not take advantage of them (Gulati, 1995; Dekker, 2004; Vosselman and van-der Meer-Kooistra (2006) and Vosselman and van-der Meer-Kooistra (2009)). They knew the contractor to be reliable based on past experience and relations. Previous recurrent transactions between the client and the new contractor (frequency dimension) and the familiarity between them lowered possible opportunistic behaviour and monitoring costs by either party.

The transacting parties became used to one another and relied on past experience (Williamson, 1975), which reduced transaction costs. For example, as claimed by the project director, "We will reduce costs on monitoring our staff since they were selected based on their experience and competence in their work. I believe that with their certification and commitment, we could manage the project better". This emerged from past transaction relations developed through interaction and learning about each other (Gulati, 1995). Cox and Thompson (1997) suggest that where there is history of good and long relations no contract is necessary - a 'gentleman's agreement' will suffice. This is consistent with Sako (1994) who refers to the situation where there is goodwill trust and what Levy (1990, 1993) describes as 'cultural norms' in Japanese construction. Sako's OCR (obligational contractual relation), characterised by high task interdependency and goodwill trust developed through a high degree of collaboration, formed transaction relations that had no need for a formal contract. Nonetheless, this case is dissimilar to that suggested by Sako as there was an intention to form a contract.

The project director and the Director of DSC explained that there was no problem as to the rights and liabilities of parties for the four months when no contract prevailed as they knew each other from other previous jobs. The letter of intent from the client to DSC following DSC's submission of a price quotation stipulated that no contract would be entered into until the formal contract documents had been progressed for signature. Then, for two months, a Letter of Award (signed in December 2001) was used as a 'binding contract'. The formal contract was formulated after this period.

As the project director explained, DSC started working on site without a formal agreement because of the element of social control such as trust, "in this business we work on a trust basis

and sometimes paper is just for records and contract matters". The client was confident that the new contractor would meet requirements within the time and budget allocated as they had successfully worked together on previous projects. Trust here is interpreted by what Nooteboom (2002) referred to as 'trust in competence'. The project coordinator commented, "We know we are giving the project to them. We know we have the price quoted, and they agree with the rate". Furthermore, DSC's director explained, "This project was offered to us on an ad-hoc basis. The client probably felt that we had done a reasonably good job in his other company in Area A. They offered us the job by giving us the basic rate… once we found that the rates are workable, and we said yes…they gave us the job. That means they have predetermined the rate for the contractor". With the design and specifications done by consultants according to agreements with the client and SPC, DSC continued the construction work without getting involved with design and drawings.

The contracting parties took a high degree of risk in continuing construction work without a signed contract, which was contrary to building construction legislation. The previous main contractor also undertook more risk since they were still officially responsible for anything that happened on site, which could give rise to many problems. Nonetheless, by dint of close supervision and coordination, all the parties (the client, DSC and SPC) managed to continue their work. The most important factor for managing the relationship was mutual consultation and close cooperation between the team, rather than a formal contract.

No formal written report on work progress was produced during the four months of transition and the subsequent two months when the Letter of Award was made, prior to the client formally awarding the contract to the new contractor. The contractor was not obliged to produce any written report on work progress because there was no formal site access yet. Therefore, there was no formal evaluation of project performance during the transition period. The project manager commented, "We haven't produced any written report on the work progress for the last four months, and this is agreed by the client. But we have our own set of records for the work we have done, since we need this in order to claim for the payment later on". During this stage the main contractor could not claim any payment for completed work. The main contractor produced no written report on work progress during the transition period but they still measured

and recorded the daily work on site. The costs incurred were measured and recorded though claims could not be made because no contract had yet been officially awarded. There was a loose link between payment, activities, and output. As the project manager commented, "We are not being paid by the client during the transition period. We can claim the payment after we signed the contract. We trust they will pay us based on previous transaction relations where we always been paid for the job, though sometimes not on time". Eventual payment resided in trust.

During the transition period, the client relied only on verbal reports from the project manager, the consultants, and the main contractor regarding work in progress. The team on site verbally communicated work progress and discussed issues on site through informal meetings (face to face) or by phone. Meetings were held only when issues could not be settled by the team on site. Observations revealed that the team used many informal means of communication, especially mobile phones, for exchanging information and organising work schedules during the conversion process. This consultation was important, according to the project team, for coordinating each other's tasks, and creating mutual understanding, commitment and good relationships.

The findings illustrate the importance of attaining the project's objectives through informal means, given that there was no formal contract. The participants agreed that they worked closely to meet the deadlines and, most of all, had confidence that they would be paid promptly. The client, as the project director explained, had sufficient confidence and trust in the team that it could meet the deadlines because everyone knew the objectives and importance of the project being finished on time. The site manager commented, "Through all means we need to settle any problems immediately to avoid delays. Materials delivery and jobs are scheduled and coordinated carefully with all sub-contractors. Any problems with the sub-contractors will be discussed immediately. So far we don't have any problems with the sub-contractors or the consultants.. the team is aware of the time schedule, because delaying their tasks would affect others and might also cause penalties." This finding is consistent with the argument that trust means having confidence that one party is not harmed or put at risk by the action of the other party (Zucker, 1986). Thus, trust led the parties to believe that each would act according to expectations, which allowed them to manage uncertainty and risk through their interactions and

jointly optimise gains from cooperative behaviour (Jones and George, 1998). The observations suggest that none of the parties sought advantage from the possible risk of opportunism.

To conclude, the management control structure of the case in the context of the contingent factors (transaction characteristics and transacting parties' attributes) discussed in the preceding sections shows close supervision and co-ordination through both formal and informal means played a crucial role. Market information, e.g. price, was used throughout the construction period starting from setting the standards when estimating and scheduling during the formation period until the measurement and evaluation of the construction costs in progress reports during the execution period. The control methods defined in the contract post formation provided tight control of construction tasks and the responsibilities of the parties. During the execution phase quality, time and costs were measured and reported regularly, consistent with bureaucratic control. The contract was the dominant mechanism used during the execution phase leading to controls inclined to bureaucracy but, interestingly, social/relational means were also important supplements for organising the transaction relationship. The use of social-based controls was particularly evident during the transition period. However, despite there being no formal contract, the previous contractual requirements were used to coordinate the interdependent tasks of inter-firm relationships in the project organisation. Table 2 summarises the control mechanisms used during the execution and transition periods.

Table 2 The Control Mechanisms during Execution and Transition Periods

Outcome Control	Behaviour Control	Social Controls
Execution:		
Contract administration - Progress reports	Project organisation structure Behaviour monitoring - supervisions, testing on compliance	Trust building - meetings, repeated interactions
Transition Period:		
Contract as coordination mechanism	Informal structure – task coordination, supervisions, testing on compliance	Trust - competence and goodwill trust

CONCLUSIONS

Building construction is often based on projects, which are one-off transactions rather than ongoing or continuous transaction relationships. Furthermore, the project team comprised of contributors who work for different organisations, which leads to a high interdependency between the professionals and hence between the companies involved. Given the specific budget invested by the client in a particular project, successful project management needs to accomplish performance specifications on or before the time limit and within budgeted costs. Because of the complexity of projects, i.e. high task differentiation, the paper investigated how construction projects are governed to meet the client's requirements under conditions of high task interdependency, complexity, and uncertainty. The reason for uncertainty lies partly in how relationships within a project organisation are structured. However, a building construction project also depends heavily on its location, and on ground and weather condition and it is also influenced by its economic and political environment, availability of capital, and is bound by legislative regulations within its particular context. This complicates further the issue of control and compounds task uncertainty. The extended theoretical framework of inter-firm relationships used to analyse this case proposed that where contributors depend heavily upon one another, social controls (e.g. competence trust, ongoing negotiations) will contribute to efficient governance structures. The findings with the use of a mixture of market, bureaucracy, and social based controls, proved consistent with Hakansson and Lind's (2004), who claimed that a blend of different control modes are necessary to coordinate all contributors (direct and indirect relationships) in a project-based organisation (Nieminen and Lehtonen, 2008).

Practitioners should therefore pay attention to the importance of relational aspects when implementing control mechanisms. This is increasingly important throughout the duration of the project, given that uncertainty increases as the project progresses. They should be aware that a trustworthy relationship, both before and after the contract is executed, helps minimise opportunistic behaviour and hence transaction costs. The selection of a team with a social element (competence trust) and the development of goodwill trust within transaction relationships are important and crucial throughout the conversion process. Hence, in order to meet the objectives of the project, the team must not forget the need for close communication and coordination, given the likelihood of an incomplete contract. Effective means of

communication, both formal and informal, between the contributors are important for developing and strengthening their relationships.

The limitations of the study need to be acknowledged. First, risk was not specifically investigated in the study. Das and Teng (2001b) claimed that a combination of control and trust can reduce risk. Some have argued that the risk factor plays an important role in inter-firm relationships (see Van der Meer-Kooistra and Vosselman, 2000). Given that a project organisation is temporary in nature, it is argued that risk (i.e. a degree of market risks, uncertainty about future contingencies, and so on) has a different and lesser effect on the design of its control structure.

Furthermore, concepts such as power, culture and history could be addressed to enhance the understanding of the complex situation of project transaction relationships. Indeed, this study suggests that the change from turnkey to build only contract was mostly due to the 'exercise of power' (Lamming, 1996). The researcher believes that the neglect of informal mechanisms, such as power, leads to an incomplete explanation of changes in contractual relationships, and stymies consideration of alternative options for economising modes of governance.

Future research needs to consider these issues, particularly power, given that the change of contract, it was argued, was essentially due to the exercise of power and contracts determine the responsibility and power in building projects (Kadefors, 1995: 402). In a turnkey contract, the client has little involvement and responsibilities compared to a build only contract. An extensive analysis of informal mechanisms would provide more insight into contract changes. These crucial factors were not included in the theoretical framework and could be fruitfully incorporated in future work.

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